

CLAIMS

- [001] An electric machine, especially a brushless DC motor, comprising a stator (3) provided with current-carrying coils and at least one partly magnetisable rotor (2) which is provided with a plurality of permanent magnets (7) in the circumferential direction, each embedded in a magnet retainer (6) between the peripheral surface and shaft (4) of the rotor (2) such that in the radial direction, the permanent magnets (7) are completely encircled by the peripheral surface of the rotor (2), characterised in that at the magnet retainer (6), material recesses (8) of the rotor extend axially inside the rotor (2) laterally in the circumferential direction of the rotor (2).
- [002] The machine according to claim 1, characterised in that the material recesses (8) extend on both sides of the magnet retainer (6).
- [003] The machine according to claim 1 or claim 2, characterised in that the material recesses (8) run parallel adjacent to the peripheral surface of the rotor (2).
- [004] The machine according to any one of claims 1 to 3, characterised in that the permanent magnet (7) embedded in the magnet retainer (6) protrudes into the material recesses (8) of the rotor.
- [005] The machine according to claim 4, characterised in that the permanent magnet (7) projects into the material recesses (8) at least with its axial edges (12) adjacent to the peripheral surface of the rotor (2).
- [006] The machine according to claim 5, characterised in that the material recesses (8) open perpendicularly on an outer surface (13) of the permanent magnet (7) adjacent to the peripheral surface of the rotor (2).
- [007] The machine according to claim 6, characterised in that the material recesses (8) have a rounded transition from a profile parallel to the peripheral surface of the rotor (2) to a profile perpendicular to the outer surface (13) of the permanent magnet (7).

- [008] The machine according to any one of claims 4 to 7, characterised in that the permanent magnet (7) abuts against a pole shoe (14) of the rotor (2) in the circumferential direction with a partial width (BS) of its outer surface (13).
- [009] The machine according to claim 8, characterised in that the partial width (BS) corresponds at least approximately to a tooth shoe width (BZ) of a stator tooth (10) in the circumferential direction.
- [010] The machine according to any one of the preceding claims, characterised in that lugs (9) extended axially through the material recesses (8) are formed on the magnet retainer (6) for holding the permanent magnet (7).
- [011] The machine according to any one of the preceding claims, characterised in that the permanent magnets (7) are rectangular and are arranged with their narrow sides in the circumferential direction.
- [012] The machine according to any one of the preceding claims, characterised in that the stator (3) has a plurality of stator teeth (10) whose end surfaces (15) of their tooth shoe (11) adjacent to the rotor are constructed as flat and tangential to the circumferential surface of the rotor (2).
- [013] The machine according to claim 12, characterised in that each stator tooth (10) carries turns of a single coil.
- [014] The machine according to any one of the preceding claims, characterised in that the electric machine (1) is constructed with eight permanent magnets (7) and twelve stator teeth (10).
- [015] The machine according to any one of the preceding claims, characterised in that the permanent magnets (7) are magnetised parallel to their side surfaces facing the material recesses (8).

[016] The machine according to any one of the preceding claims, characterised in that the permanent magnets (7) contain ferrite and/or NdFeB and/or rare earths.

[017] The machine according to any one of the preceding claims, characterised in that the permanent magnets (7) are the same length in the axial direction or longer than the rotor (2, 5).